



Introduction to the PHIN
Health Level Seven (HL7)
Message Implementation Guides

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Centers for Disease Control and Prevention



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1 Revision History

Comment	Date	Author
Initial Draft	April 2, 2003	J. Marc Overhage
Update and add contents	May 1, 2003	Mead Walker

Last Saved: May 9, 2003

2 Rationale

The PHIN (Public Health Information Network) initiative is a comprehensive architecture of data and information systems standards intended to advance the development of efficient, integrated and interoperable public health information systems. PHIN development, along with the work of related initiatives such as eHI (e-Health Initiative) is based on the fundamental understanding that exchange of health-related information between healthcare providers, public health agencies, and the general public is an essential aspect of public health surveillance and response. As a consequence, messaging – the electronic exchange of data between computerized information systems – is a key element of the PHIN architecture.

The development and effective management of data interchange (messaging) requires the use of generally accepted standards. These standards become more widely used and more effective when they are developed by a widely based, consensus process, rather than by any single organization. Furthermore, use of industry standards is a basic tenet of the e-Government initiative which provides direction to CDC as to other government agents. Since it is generally accepted that Health Level Seven (HL7) standards are the prevailing industry standards for communicating clinical and laboratory data in the form of electronic messages, CDC has chosen to work with HL7 as the primary source for interface standards.

The breadth and general applicability of the HL7 standard are advantageous to a wide variety of users but also present challenges for specific implementations in public health and other contexts. Public health messaging partners need to define with particularity, the data to be passed, and the circumstances under which it is passed. In other words, it is necessary to develop message implementation guides based around specific scenarios or use cases. These guides are necessary because they introduce the level of specificity required in order to define verifiably compliant messages.

3 What is an Implementation Guide?

A public health messaging implementation guide is a document that describes:

- a) The circumstances under which messaging takes place.
- b) The data which is passed in a particular message.
- c) Additional specifications and guidance to assist in message implementation.

A wide range of use cases and partners are involved in public health messaging. Despite a multiplicity of specific message contexts, many of the same partners are involved as message receivers and message senders. As a result, consistency in both the form and content of message implementation guides can help establish and maintain a common, standards-based approach to electronic messaging.

At a high level, guides using both Version 2 and Version 3 HL7 need to address the same set of requirements as listed and briefly described below. Note, not all these guides were created at the same time, or by the same organization, so the list of requirements should be seen as guidelines

to be evaluated in light of particular circumstances.

3.1 Version 2 Guide Requirements

The guide should include the following contents:

- **Abstract Message(s):**
Description of the particular pattern of segments and segment groups that will be supported for each trigger event. If multiple trigger events are discussed in the guide there will normally be an abstract message specification for each.
- **Segments and Fields:**
Specification of each HL7 segment and field that messaging partners will need to support. The documentation may include descriptive material from the HL7 specification, or the reader may simply be referred to the relevant HL7 specification. In particular, the guide should indicate whether “optional” segments and fields do not need to be supported, or whether the included data should be passed if it is available to the message sender. It is especially important to include specific mention if a particular segment or field is used in a specialized way which either constrains or varies from the ordinary understanding of the HL7 documentation.
- **Example Message:**
An example message or messages should be provided to provide concrete examples of the way in which HL7 is being used to support public health interfacing needs.
- **Supported Datatypes:**
The document should include specifications for the relevant HL7 datatypes. This is particularly important because it is unlikely for a specific interface to make use of all the components of a particular datatype. Note, the key role of this section is to document restrictions to the HL7 standard. {{make clearer}}
- **Vocabulary Items:**
There should be a list of all HL7 tables which are to be supported, and the contents of any user defined table should be included. Specifications developed after April, 2003 should include a discussion of the value sets and coding systems to be supported.
- **Object Identification:**
If OIDs (ISO Object Identifiers) are used – this applies to specifications developed after April, 2003 – there should be a discussion of their derivation and use. In any case, the principal identifiers used should be discussed, as well as the provisions that message creators should take to assure uniqueness.
- **Discussion of HL7 messaging/Background material:**
The guide may contain discussion of such topics as HL7 parsing, HL7 acknowledgments, or other aspects of HL7 implementation and use that are normally contained in the documentation provided by HL7 as part of the standard.

3.2 Version 3 Guide Requirements

The guide, or accompanying documentation, should include the following contents:

- **Messaging Requirements & Supported Interactions:**
This section documents the functional requirements served by the message or messages, and describes the interactions (specific messaging scenarios) that are supported.
- **Refined Message Information Model:**
Documentation and display of the model that contains the contents of the message as a derived product from the HL7 Reference Information Model
- **Supporting Models:**
Documentation of additional models as required to fully document the message contents.

- **Hierarchical Message Description:**
The hierarchical message description (HMD) is the abstract specification of the V3 message. This corresponds to the V2 abstract message and segment descriptions.
- **Example Message:**
An example message or messages should be provided to provide concrete examples of the way in which HL7 is being used to support public health interfacing needs. Note, a Version 3 message will be recognizable as an XML document, and could be displayed using XML tooling.
- **Supported Datatypes:**
The document should include specifications for the relevant HL7 V3 datatypes. This is particularly important because it is unlikely for a specific interface to make use of all the components of a particular datatype. Note, the key role of this section is to document restrictions to the HL7 standard.
- **Vocabulary Items:**
There should be a list of all HL7 domains which are to be supported, and the coding systems that are to be used within those domains. The contents of any user defined value sets should be included.
- **Object Identification:**
The way in which OIDs (ISO Object Identifiers) are used to support instance identification and vocabulary management should be discussed. The list of relevant OIDs for messaging partners and vocabulary items should be included.
- **Discussion of V3 Principles:**
If desired, the document may include discussion of relevant aspects of the Version 3 message development framework.

4 Available Implementation Guides

The implementation guides are intended to provide assistance in implementing a standard message or group of messages to accomplish a stated objective. The goal is to provide information on the specific subset of interface standard that is needed to accomplish a particular purpose

The following implementation guides or related documents have been created, or are in the process of creation:

4.1 HL7 Version 2 Implementation Guides

The list of Version 2 implementation guides that are currently available is provided below:

Implementation Guide for Transmission of Laboratory-Based Reporting of Public Health Information using Version 2.3.1 of the Health Level Seven (HL7) Standard Protocol	
HL7 Version: 2.3/2.3.1	Date Published: 04.24.2003
Guide Scope: Use of the HL7 standard for transmission of laboratory results for notifiable disease conditions from laboratories to public health agencies.	

Implementation Guide for Transmission of Microbiology Result Reporting of Public Health Information using Version 2.3.1 of the Health Level Seven (HL7) Standard Protocol

HL7 Version: 2.3.1 | **Date Published:** 05.12.03

Guide Scope: This guide complements the Implementation Guide for Transmission of Laboratory-Based Reporting of Public Health Information. Its primary intended use is for initial reporting of microbiology results, such as initial microbial growth in a blood or sputum culture before a specific organism has been identified.

Implementation Guide for Transmission of Laboratory, Pharmacy and Supply Orders as Public Health Information using Version 2.3.1 of the Health Level Seven (HL7) Standard Protocol

HL7 Version: 2.3.1 | **Date Published:** 05.06.03

Guide Scope: This guide documents use of the HL7 standard to support transmission of information about laboratory, pharmacy, and supply orders issued for patient care to public health agencies.

Implementation Guide for Transmission of Patient Chief Complaint as Public Health Information using Version 2.3.1 of the Health Level Seven (HL7) Standard Protocol

HL7 Version: 2.3.1 | **Date Published:** Pending

Guide Scope: This guide documents use of the HL7 standard support transmission of chief complaints for new inpatient, outpatient, and emergency encounters from clinical systems to public health agencies.

Laboratory Result Message for Bio-terrorism Response

HL7 Version: 2.4 | **Date Published:** 04.18.2003

Guide Scope: Health Level 7 (HL7) Version 2.4 ORU (Unsolicited Observation Message) to support reporting laboratory results in the context of Bio-terrorism response messaging.

4.2 HL7 Version 3 Implementation Guides

The list of Version 3 implementation guides that are currently available is provided below:

Neisseria meningitides Case Notification

HL7 Version: 3.0 | **Date Published:** 05.10.2003

Guide Scope: This document provides a reference for implementing Notification Reporting under the PHIN architecture for a particular disease entity, or group of related disease entities. This particular implementation guide addresses the specific reporting requirements for *Neisseria meningitides* cases.

Haemophilus influenzae Case Notification

HL7 Version: 3.0 | **Date Published:** 05.10.2003

Guide Scope: This document provides a reference for implementing Notification Reporting under the PHIN architecture for a particular disease entity, or group of related disease entities. This particular implementation guide is designed to the specific reporting requirements for *Haemophilus influenzae* cases.

Group B <i>Streptococcus</i> Case Notification	
HL7 Version: 3.0	Date Published: 05.10.2003
Guide Scope: This document provides a reference for implementing Notification Reporting under the PHIN architecture for a particular disease entity, or group of related disease entities. This particular implementation guide is designed to support the specific reporting requirements for Group B <i>Streptococcus</i> .	

Group A <i>Streptococcus</i> Case Notification	
HL7 Version: 3.0	Date Published: 05.10.2003
Guide Scope: This document provides a reference for implementing Notification Reporting under the PHIN architecture for a particular disease entity, or group of related disease entities. This particular implementation guide is designed to support the specific reporting requirements for Group A <i>Streptococcus</i> cases.	

<i>Streptococcus pneumoniae</i> Case Notification	
HL7 Version: 3.0	Date Published: 05.10.2003
Guide Scope: This document provides a reference for implementing Notification Reporting under the PHIN architecture for a particular disease entity, or group of related disease entities. This particular implementation guide is designed to support the specific reporting requirements for <i>Streptococcus pneumoniae</i> cases.	

Other Meningitis Case Notification	
HL7 Version: 3.0	Date Published: 05.10.2003
Guide Scope: This document provides a reference for implementing Notification Reporting under the PHIN architecture for a particular disease entity, or group of related disease entities. This particular implementation guide is designed to support the specific reporting requirements for those invasive streptococcal disease and those bacterial meningitis cases (non-invasive) cases that do not fit the categories listed above.	

Hepatitis A Acute Case Notification	
HL7 Version: 3.0	Date Published: 05.10.2003
Guide Scope: This document provides a reference for implementing Notification Reporting under the PHIN architecture for a particular disease entity, or group of related disease entities. This particular implementation guide is designed to address the specific reporting requirements for acute Hepatitis A.	

Hepatitis B Acute Case Notification	
HL7 Version: 3.0	Date Published: 05.10.2003
Guide Scope: This document provides a reference for implementing Notification Reporting under the PHIN architecture for a particular disease entity, or group of related disease entities. This particular implementation guide is designed to address the specific reporting requirements for acute Hepatitis B.	

Hepatitis C Acute Case Notification	
HL7 Version: 3.0	Date Published: 05.10.2003
Guide Scope: This document provides a reference for implementing Notification Reporting under the PHIN architecture for a particular disease entity, or group of related disease entities. This particular implementation guide is designed to address the specific reporting requirements for acute Hepatitis C.	

Perinatal Hepatitis B Case Notification	
HL7 Version: 3.0	Date Published: 05.10.2003
Guide Scope: This document provides a reference for implementing Notification Reporting under the PHIN architecture for a particular disease entity, or group of related disease entities. This particular implementation guide is designed to address the specific reporting requirements for perinatal Hepatitis B virus infection.	

Chronic/Resolved Hepatitis C Case Notification	
HL7 Version: 3.0	Date Published: 05.10.2003
Guide Scope: This document provides a reference for implementing Notification Reporting under the PHIN architecture for a particular disease entity, or group of related disease entities. This particular implementation guide is designed to address the specific reporting requirements for Hepatitis C virus infection, chronic or resolved.	

Hepatitis Non-ABC, Chronic Hepatitis B Case Notification	
HL7 Version: 3.0	Date Published: 05.10.2003
Guide Scope: This document provides a reference for implementing Notification Reporting under the PHIN architecture for a particular disease entity, or group of related disease entities. This particular implementation guide is designed to address the specific reporting requirements for acute Hepatitis Delta, Co- or Super-Infection, acute Hepatitis E, chronic Hepatitis B virus infection, acute Hepatitis Non-ABC.	

Measles Case Notification	
HL7 Version: 3.0	Date Published: 05.10.2003
Guide Scope: This document provides a reference for implementing Notification Reporting under the PHIN architecture for a particular disease entity, or group of related disease entities. This particular implementation guide is designed to support reporting for measles	

Rubella Case Reporting	
HL7 Version: 3.0	Date Published: 05.10.2003
Guide Scope: This document provides a reference for implementing Notification Reporting under the PHIN architecture for a particular disease entity, or group of related disease entities. This particular implementation guide is designed to support reporting for rubella. The document addresses the specific reporting requirements for Rubella, and Chronic Rubella Syndrome (CRS)	

Pertussis Case Notification	
HL7 Version: 3.0	Date Published: 05.10.2003
Guide Scope: This document provides a reference for implementing Notification Reporting under the PHIN architecture for a particular disease entity, or group of related disease entities. This particular implementation guide is designed to support reporting for Pertussis	

Generic Case Notification	
HL7 Version: 3.0	Date Published: 05.10.2003
Guide Scope: This document provides a reference for implementing Notification Reporting under the PHIN architecture for those diseases that do not have specifically assigned implementation guides.	

Summary Case Notification	
HL7 Version: 3.0	Date Published: 05.10.2003
<p>Guide Scope: This document provides a reference for implementing Notification Reporting under the PHIN architecture for a particular disease entity, or group of related disease entities. This particular implementation guide is designed to support summary case reporting across all disease entities. The summary guide provides information about the number of cases of a particular disease or condition which have been reported during a particular time period.</p>	

4.3 Using the implementation guides

These guides are intended to provide detailed information for using the HL7 standard to fit a particular interoperability requirement. The following are a high level set of steps that will normally be followed when using these guides.

- Determine that you have the proper guide for a particular functional situation. For example, to send chief complaint data in the context of syndromic surveillance refer to the Implementation Guide for Transmission of Patient Chief Complaint as Public Health Information
- Verify the specific data to be sent. Within the context of the guide, the sender needs to decide which data will be required or desired to send to a public health agency. For the most part, the implementation guides do not prescribe what data to send but only how to send it. However, there are some attributes or fields that are listed as mandatory. Without this information, there is little value in sending a message at all.
- Specify the implementation needs for the physical exchange of messages with public health. If the PHIN Messaging System (MS) will be used, refer to the documentation for that application. If other means of communication are to be used the precise specifications for the implementation need to be agreed upon between all messaging parties.
- Plan to implement specified vocabularies and identification schemes. Information on OIDs, coding systems and value sets should be provided in the implementation guide. It will be necessary to ensure that the codes used internally are properly mapped to the standard code sets.

5 Related Documents

This document is designed as an introduction to the set of implementation guides and related documents provided by the Centers for Disease control & Prevention. In addition to the implementation guides listed above, the following documents are available:

- PHIN Notification Messaging Basic Description: a detailed description of CDC's HL7 Version 3 Notification Message
- An Overview of PHIN MS: intended for users, administrators and programmers. The document provides general information about how the PHIN messaging system works
- PHINMS Client Installation Guide, PHINMS Server Installation Guide: instructions to guide installation and configuration of the PHINMS software.

The following guides or related documents are planned or in progress:

- Guide to Using Object Identifiers (OIDs)
- Guide to Accessing and Managing Public Health Vocabularies.

For CDC documentation to support public health interfaces contact:

Information Resource Management Office
Centers for Disease Control and Prevention
Atlanta, GA 30333
Public Health Information Network (PHIN) Website: <www.cdc.gov/phn>

5.1 Related External Documentation

Implementers need to refer to the official documentation of HL7 standards for detailed explanation of the standard, and for a wealth of information that is not included in the detailed implementation guides. These specifications are documented in a series of standard releases:

- Health Level Seven; Version 2.3.1, 1999
- Health Level Seven; Version 2.4, 2000
- Health Level Seven; Version 3.0 Ballot Package, 2003

For information regarding the HL7 standard contact:

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